

Asymic synthesis under pressure. S. E. Brezler, G. V. Samsonov, and N. A. Selezneva (Phys.-Chem. Inst., Leningrad). *Biochimiya* 14, 624-37(1949); cf. *C.A.* 43, 7044, 7049b. — In the resynthesis of proteins by trypsin under high pressures, suitable buffers are borate and carbonate. A barbitol buffer also permits of extensive resynthesis, although the yield is far from 100%. The tryptic resynthesis of gelatin is complete at 6000 atm. Only about 20% of the gelatin is resynthesized at 2000 atm. If the original, unchanged gelatin and trypsin are brought to a pressure of 2000 atm., 80% of the gelatin becomes hydrolyzed. Each pressure has its own equil. point. The synthesis is less favorable with enzymes that act in acid media. Thus, egg albumin is resynthesized by pepsin in dil. HCl at 10,000 atm. only to the extent of 63%. Papain is also able partially to resynthesize egg albumin at pH 7 and 8.3. With both pepsin and papain, the extent of the resynthesis is greater in a more acid medium. A theoretical explanation is offered for this phenomenon. Pancreatin, activated by Zn, converted alanine at 6000 atm. into alanylalanine, which was detected by chromatographic absorption analysis. H. Priestley

SAMSONOV, G.V.

Composition of surface layer and vapor of solutions. Uch.zap.⁴en.
un. no.108:114-137 '49. (MIRA 10:3)
(Solution(Chemistry)) (Dipole moments)
(Surface chemistry)

184T23

SAMSONOV, G. V.

USSR/Chemistry - Azeotropic Distillation Jan/Feb 51
Nitrobenzene-Hexane Mixtures

"Surface Tension of Binary Systems Near the Separation State," G. V. Samsonov, Leningrad Physicotech Inst, Acad Sci USSR

"Kolloid Zhur" Vol XIII, No 1, pp 46-50

Investigated adsorption of 2d components of binary systems $\text{HCOOH-C}_6\text{H}_6$ (I) and $\text{C}_6\text{H}_5\text{NO}_2\text{-n-C}_6\text{H}_{14}$ (II) on surfaces of solns. Satisfying necessary conditions for finiteness of adsorption, isotherms of surface tension against % of 2d component for I at 75° , 79° C showed extremum (min); isotherms of II at 22° , 35° showed point of inflection with horizontal tangent.

184T23

LC

USSR/ Chemistry - Physical chemistry

Card 1/1 : Pub. 22 - 35/46

Authors : Samsonov, G. V.

Title : The theory of equilibrium of an ion-exchange chromatography

Periodical : Dok, AN SSSR 97/4, 707-709, Aug 1, 1954

Abstract : The basic problem confronting the theory of ion-exchange in chromatography, is explained. A simplified solution for this problem, based on equilibrium representations (equilibrium between solution and ionite is fixed instantaneously), is presented. The author believes that this solution will not distort the results since the chromatographic processes of separating analogous substances take place at low-weight-rates of the solution. Five USSR references (1948-1953).

Institution :

Presented by : Academician A. F. Ioffe, May 26, 1954

SAMSONOV, G. V.

U S S R

Disturbance of chemical equilibria in surface layers.
S. E. Bresler and G. V. Samsonov. *Bull. Acad. Sci.*
U.S.S.R., Div. Chem. Sci. 1954, 21-6 (Engl. translation).
See *C.A.* 48, 13342b.

H. L. H.

JAMSONOV, G.V.

Disturbances of chemical equilibria in surface layers.
S. E. Bresler and G. V. Jamsonov (*Acad. Sci. U.S.S.R.*).
Izvest. Akad. Nauk SSSR, Khim. Nauk 1954, 27-33.—A study was made of the problem of the equil. of chemically interacting substances in the surface layer. Investigations in the direction of chem. processes led to an insol. film, applied to the surface of a liquid. The process involved seems to be a synthesis of esters from acid and alc. The present report consists of a systematic investigation of the process of esterification of different org. acids and alcohols by the method of Langmuir-Adams, as well as by the help of microchem. colorimetric analysis. A series of org. acids from dodecyl to palmitic was studied, and a series of alcohols from hexadecyl to octadecyl was used. Unimol. surface films were applied to the surface of water in the Langmuir bath. Surface tension was measured by means of a torsion balance by using the method of breaking away of a glass plate having a perimeter of 20 mm. The error involved in this measurement was 0.25 dynes/cm. For applying the film, a 0.1% soln. of acid and alc. in hexane was employed. This soln. was applied in the quantity of 5-6 drops from a specially calibrated micropipet. The esters formed were recovered and subjected to colorimetric analysis, after addn. of hydroxylamine to produce a red color. The synthesis of ester from a fatty acid and an alc. was demonstrated, and it was shown that under conditions of monolayers, reactions of dehydration proceed in the presence of practically endless reservoirs of water, and that the original conditions in the surface layer displace the chem. equil. from hydrolysis to synthesis. Data are presented graphically. G. S. M.

SAMSONOV, G.V.

[Chromatography; its use in biochemistry] Khromatografiia; primeneni
v biokhimi. Leningrad, Medgiz, 1955. 179 p. (MLRA 9:5)
(CHROMATOGRAPHIC ANALYSIS) (BIOCHEMISTRY)

SAMSONOV, G. V.

✓ Theory of chromatography. S. B. Hester and G. V. Samsonov. *Uspekhi Khim.* 24, 685-1002 (1955).—A summary review of theoretical chromatography through 1954 with 35 references. G. M. Kosolapoff

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Distr: hElj

Sharpening of the front boundary in ion-exchange chromatography, G. V. Sidorov, *Khromatografiya, Leningrad. Gosudarst. Univ. im. A. A. Zhdanova, Sbornik Statei* 1956, 22-9. From the theory of equil. ion-exchange chromatography the following formula is derived: $C_{crit.} = mK \exp(Z_1 Z_2 / (Z_1 - Z_2))$, where $C_{crit.}$ = a crit. concn., m = exchange capacity of resin, K = exchange const., Z_1 and Z_2 = ionic charges. At this concn. the derivative dm/dC_1 , where C_1 is concn. of exchanging ion, changes sign. If $Z_1 > Z_2$, the sharpening of boundary occurs for $C_0 > C_{crit.}$, where $C_0 = \Sigma C_i$, and C_i = concn. of exchanging ion. If $Z_1 < Z_2$, the sharpening of boundary occurs for $C_0 < C_{crit.}$. Increase in the concn. of exchanging ion favors the sharpening of boundary when ions with small charges exchange with ions of greater charges and vice versa. When substances are not completely dissociated and ionic charges are the same, the sharpening of boundary occurs for $K(\alpha_1/\alpha_2) > 1$, where α_1 and α_2 = degrees of dissociation. If ionic charges differ, then for a system where ions with small charges exchange with those of greater charges the sharpening occurs for: $C_0/C_1 < C_{crit.}$, and in an opposite case $C_0/C_1 > C_{crit.}$, where $C_{crit.} = m[\alpha_1 \exp(Z_1/(Z_1 - Z_2)) / \alpha_2 \exp(Z_1/(Z_1 - Z_2))] K \exp(Z_1 Z_2 / (Z_1 - Z_2))$. A. Libackyj.

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SAMSONOV, S. V.

Chem ✓ Statics and dynamics of the exchange of streptomycin
ions with metal and hydrogen ions on carboxylic resins,
G. V. Samsonov and S. E. Bresler. Colloid J. U.S.S.R.
18, 327-32 (1956) (English translation). —See C.A. 51, 799d.
B. M. R.

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С. М. С. А. Ю. В. В.

Category: USSR / Physical Chemistry - Surface phenomena. Adsorption.
Chromatography. Ion exchange.

B-13

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 30218

Author : Samsonov G. V., Bresler S. Ye., Vansheydt A. A., Kuznetsova N. N.,
Lavrent'yeva S. F., Shesterikova M. P.

Inst : not given

Title : Sorption of Streptomycin by Carboxyphenol Resins

Orig Pub: Antibiotiki, 1956, 1, No 5, 42-46

Abstract: Trivalent cations of streptomycin (Str^{3+}) are sorbed irreversibly at sulfocathionites while with purely carboxylic cathionites (KFU and KMT) absorption capacity for Str^{3+} amounts to only 38-22% of their capacity for simple inorganic cathions (Na^+ and Ca^{2+}), evidently due to steric hindrances caused by excessively close distribution of carboxyl groups. It was found, in accord with the theoretical assumption, that the readily swelling, capable of ion-exchange

Card : 1/2

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SAMSONOV, G. V.

2

Exchange of streptomycin ions for the ions of sodium and calcium in zeolite. G. V. Samsonov and S. E. Bresler. Inst. High-Mol. Comnds., Acad. Sci. U.S.S.R., Moscow. Dokl. Akad. Nauk 18, 88-92 (1956). An ion exchanger prepared from 20% solns. of NaAlO₂ and Na₂CO₃ and dry gel containing 2 g and a capacity of 3.8 meq/g for Ca⁺⁺. The exchange capacity for streptomycin (I) (contg. 60% streptomycin in base and 10-20% NaCl) was 0.1, and was independent of the grain size of the exchanger. In the equation $m^2/n^2 = K(C_1/C_2)$, K was 6 for I and Na and 3.7 for I and Ca. m and n are the units. of I and Na (or Ca) sorbed, C₁ and C₂ are concns. of I and Na (or Ca), resp., $y = 1/2$, is the valency of Na (or Ca). In accord with equation, the uptake of I from more dil. solns. (at a concn. of 0.1 g/l) was greater than from more concd. solns.; thus 1 g. exchanger took up 23 mg. I from a soln. of 0.1 g/l. I and 0.15N NaCl. J. J. Bikerman

Am. J. Chem. Soc.

SAMSONOV, G.V.

11a. Ion-exchange chromatography of streptomycin on permutite. S. B. Bresler and G. V. Samsonov (Inst. High-Mol. Compds., Acad. Sci. U.S.S.R., Leningrad). *Kolloid. Zhur.* 18, 155-7(1956); cf. *C.A.* 50, 6038c. Streptomycin can be purified by filtration through permutite and elution with 20% NaCl soln: flowing at the rate of 25 cm./hr. In accord with the theory (*C.A.* 51, *C.A.* 51, 8508f), weak NaCl solns. gave a diffuse boundary with streptomycin.

J. J. Bikerman

SAMSONOV, G.V.

USSR/Physical Chemistry. Surface Phenomena. Adsorption.
Chromatography. Ion Exchange.

B-13

Abs Jour : Ref Zhur - Khimiya, No 7, 1957, 22561.

Author : G. V. Samsonov, S. E. Bresler.

Inst : Not given

Title : Statics and Dynamics of Streptomycin Ion Exchange with Metal
and Hydrogen Ions on Carboxyl Tars.

Orig Pub : Kolloid. Zh. 1956, 18, No 3, 337-343 (rez. angl.)

Abstract : Carboxyl cationites (CC) unlike sulfocationites sorb streptomycin (I) reversibly from solutions, but only in case when CC are used in Na⁺, K⁺, or NH₂⁺ salt form. Exchange capacity of CC in relation to I depends on the degree of tar swelling, which creates new possibilities for increase of accessibility of ionite active centers for large ions I, in comparison to permutites (RZHKhimii, 1956, 57703). Equilibrium of the I ion exchange with metal cations conforms with B.P. Nikol'skiy's equation, if we take in account only those metal ions in cationite which can exchange with I. For one g-mole of I - 3g-mole of Na⁺ are displaced and as a result of that a

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Card 2/2

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SAMSONOV, G.V.

Sorption and chromatography of Aureomycin. G. V. Samsonov, S. E. Bresler, and N. A. Rozentsvelg (Inst. High-Mol. Compds., Acad. Sci. U.S.S.R., Leningrad). *Kolloid. Zhur.* 18, 470-3(1956).—Aureomycin-HCl (I), from a 0.05% soln., was most strongly adsorbed by C, anion-exchanger "NO," and several cation exchangers, but the adsorption on C was not reversible. The adsorptive capacity of Al_2O_3 depended on the sample and increased when the temp. of preheating Al_2O_3 increased (between 100 and 600°); other constituents of the broth greatly decreased the adsorption of I. For desorption of I from Al_2O_3 , HCl at pH < 2 had to be used. The eluate contained more (e.g., 100 times as much) $AlCl_3$ than after percolation through Al_2O_3 free of I; hence, I formed a chem. compd. with Al_2O_3 . I was extd. from its mixt. with $AlCl_3$ by BuOH. The exchange resin "NO" took up 16 mg. I/g., and I could be displaced by 0.1N HCl in BuOH. J. J. Bikerman

Met 3

SAMSONOV, G. V.

✓ Statics and dynamics of the exchange of Aureomycin and Terramycin ions with hydrogen and sodium ions on cation exchangers. G. V. Samsonov, L. M. Shuvaleva, M. P. Shesterikova, S. P. Lavrenteva, V. S. Maslennikova, A. A. Kononova, and V. V. Bokareva (Inst. High-Mol. Comps., Acad. Sci. U.S.S.R., Leningrad). *Kolloid. Zh.* 18, 474-480, 1956. of preceding abstr. — The exchange capacity of sulfo resins for Aureomycin (I) and Terramycin (II) was greater the greater the swelling of the resin. The equation $m_1 m_2 = K C_1 / C_2$ was valid if m_1 meant the no. of small ions present in the resin and capable of being exchanged for I or II; m_2 = no. of I or II ions (which are univalent) in the resin, C_1 and C_2 are the concns. of antibiotic and of small ions, resp. in the soln. The exchange const. K of I was 100-220 for Na resins and 130-425 for H resins; the K of II was less for a phosphate resin and a sulfo resin. The uptake of I and II by ion exchangers occurred with a sharp boundary, but their displacement by aq. HCl was very gradual; hence, a soln. of HCl in MeOH had to be used. J. J. Birkman

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SAMSONOV, G. V.

USSR/Surface Phenomena. Adsorption. Chromatography. Ion Interchange B-13

Abs Jour : Ref Zhur - Khimiya, No 8, 1957, 26385

Author : G.V. Samsonov

Title : Influence of Swelling Degree of Ion-Interchanging Resins on Sorption Selectivity of Ions of Aureomycin, Terramycin and Streptomycin by Cation-Interchanging Resins.

Orig Pub : Kolloid. zh., 1956, 18, No 5, 592-596.

Abstract : An original variation of the osmotic thermodynamical theory of ion interchange equilibrium is offered, and the expression of the selectivity factor $K = \exp(r - n_s) \Delta \phi_s / RT$ is derived; in this equation, $\Delta \phi$ is the change of the thermodynamical potential of the system in the result of the transfer of the solvent from the phase of swollen resin into the exterior solution (or vice versa), r is a constant (at given conditions of the experiment) representing the sum of chemical potentials of interchanging ions in the standard state, and n_s is the number of mols of the transferred solvent. At an interchange of like ions in resins with different swelling, the magnitude of K changes at the expense of $n_s \Delta \phi_s$ as far as $n_s \Delta \phi_s$ remains positive while the swelling degree increases, consequently,

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: 1/2

✓ The chromatographic study of insulin with the aid of ion-exchange resins. G. V. Zamsonov and M. D. Fadeeva (Inst. High-Molecular Compds., Acad. Sci. U.S.S.R., Leningrad). *Biokhimiya* 21, 403-11(1956). —A theoretical discussion of the phenomenon of insulin sorption by ion-exchange resins is presented. The theoretical principles underlying the elution of insulin from the resins and of their sharp delimitation in the ionic exchange zones in instances of weakly dissociated substances are analyzed as specific physicochemical problems, some phases of which are analyzed mathematically and the conclusions expressed in terms of mathematical generalizations (*Doklady Akad. Nauk S.S.S.R.* 97, 707(1954)). Methods are described for the prepn. of C^{14} labeled insulin and for the chromatographic partitioning of insulin from exts. of the pancreas. A method is described for the complete elution of insulin from ion-exchange sulfo resins with 1N NH_4OH . Insulin- C^{14} was obtained by a union between the mol. of insulin with a mol. of C^{14} -glycine. The identity of C^{14} labeled insulin with cryst. insulin was established chromatographically. A chromatographic method is presented for the separation of insulin from the H_2O ext. of the pancreas which yields an insulin prepn. of 15-17 milliuits/mg. activity.

B. S. Levine

Separation and chromatography of Aureomycin. V.
Samsonov, S. B., Brester, and N. A. Rozentsvelg. *Colloid J.*
(U.S.S.R.) 43, 481-4 (1966) (English translation).—See
C.A. 51, 1534g. B. M. R.

SAMSONOV, G.V.; LAVRENT'YEVA, S.F.; SHESTERIKOVA, M.P.

Dynamics of streptomycin sorption by carboxyl resins in the presence of polyvalent metal ions [with summary in English] Antibiotiki, 2 no.2:32-35 Mr-Apr '57 (MLRA 10:5)

1. Institut vysokomolekulyarnykh sovedineniy AN SSSR i Leningradskiy khimiko-farmatsevticheskiy institut.

(STREPTOMYCIN

dynamics of sorption by carboxyl resins in presence of polyvalent metal ions)

(RESINS

carboxyl resins sorption of streptomycin, dynamics in presence of polyvalent metal ions)

(IONS, eff.

polyvalent metal ions,)

Samsonov G.V.

Distr: 4243

Exchange of sodium and calcium ions in swelling sulfo and carboxy resins. G. V. Samsonov, A. A. Vasilev, and V. A. Vasileva (Inst. High-Mol. Weight Compounds, Leningrad) *Zh. Fiz. Khim.* 1964, 38, 4, 924-927. 4453g. In Russian. 4 refs.

It is shown that the swelling capacity of the ion-exchange resins, the greater is the swelling capacity of the ion-exchange resin, m_1 and m_2 are the molar masses of Na^+ and Ca^{2+} ions, respectively, in the solution. When the k of the sulfo resins increased from 1 to 3, K decreased for Ca^{2+} and Na^+ from 1.5 to 0.5, and when k of 3 carboxy resins increased from 1.5 to 3, K diminished from 0.5 to 0.3. The above equation was valid for the carboxy resins in solns. more concentrated than 0.05N, the activity coeffs. must be considered. The carboxy resins were made by condensation of $\text{PhOCH}_2\text{CO}_2\text{Na}$ with CH_2O and had exchange capacities of 4.1-4.4 mg-equiv./g. The sulfo resins were made from partly sulfonated PhOH and CH_2O ; they contained 1.6-12% S and exchanged 2.7-4.8 mg-equiv./g. After the amt. of CH_2O was increased from 1 to 4 g/mol, k of 2 and more CH_2O was added.

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Distr: 4E4j

Mutual displacement of components in ion-exchange chromatography / G. V. Samsonov and V. A. Orstova
Inst. High-Polymer Comps. Leningrad. *Revised 2000*
19 815-15 1957. cl. C.A. 51.160446 — When a series of 2
exchangeable ions of valencies m and n move per unit
through an ion exchanger, the order of elution is
determined by the ratio m/n . If $m/n > 1$, the ion with
valency m is eluted first. If $m/n < 1$, the other ion (of valency n) is eluted in the first place.
is the exchange capacity of the column and A is the ex-
change constant for the n ions. The theory was confirmed by
experiments with PbCl_2 and PbCl_2 in Me₂SO solution using ion-ex-
change resin of sulfonated SBF.

fm

SAMSONOV, G.B.

AUTHOR SAMSONOV, G.B., KOZNETSOVA, N.P.

20-2443/62

TITLE The Mechanism Underlying the Sorption of Dipolar Ions by Ionites.
(Mekhanizm sorbtzii dipolyarnykh ionov ionit'ami -Russian)

PERIODICAL Doklady Akad.Nauk SSSSR, 1957, Vol 115, Nr 2, pp 351-353 (U.S.S.R.)

ABSTRACT Dipolar ions (amino acids, polypeptides, proteins in solutions of a certain acid degree) carry positive and negative charges at the same time. This property must influence the process of its sorption by ionites which is based on electrostatic interaction of the ions with ionite. In the case of a sorption of dipolar ions, in contrast to a sorption of ions with charges of same sign, electrostatic repulsion must manifest itself beside electrostatic attraction. This fact was disregarded hitherto. Even in most important papers the current conceptions on the sorption mechanism were used without taking into account the peculiarity of dipolar ions. The authors succeeded in proving by their investigations that the sorption of dipolar ions takes place according to laws essentially different from those governing the sorption of ions with one and the same sign. The tests were performed in amino acids. First the equivalence of exchange was studied: glycine, alanine and leucine were sorbed on sulfur resin SDV-3 (in N-form) under dynamic conditions. The exchange was also studied in the inverse process namely in the case of a displacement of amino acids by a solution of 0,01 N HCL. As may be seen from ill.1, there exists a complete equivalence between the quantity of hydrogen and the quantity of displaced alanine ions. It has to be stated that the hydrogen ion does not enter the solution, but jumps over to the negative-charged end of the

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The Mechanism Underlying the Sorption of Dipolar Ions 20-2-43/62
by Ionites.

dipolar ion. Thereby the dipolar ion is converted to a cation and is sorbed without electrostatic inhibition. A system is also proposed for the inverse process. The amino acid here exists in form of a cation since the solution possesses considerable acidity. In this connection it is essential that the equivalence concerns only the process in question here. The portion of alanine transformed to a dipolar ion shall not be taken into account here. The neutralization of the carboxyl group of the dipolar ion can take two directions: 1. Sorption of dipolar ions under great difficulties on the sodium form of the resin due to competition between electrostatic attraction and repulsion. The results confirm that. 2. The action of the carboxyl group is weakened by acetone as solvent, since the carboxyl group of amino acids is not dissociated here. Tab. 2 summarizes the results of the determination of the sorption capacity of glycine and alanine by the carboxyl resin KFU and sulfur resin SNF (both resins in a sodium form) from a 0,01 N- amino acid solution in 75% acetone and water. From the water solution the amino acid is very insignificantly sorbed. On transition to a water-acetone solution the sorption capacity considerably increases. In the case of a greater distance between amino and carboxyl groups the influence of carboxyl is weakened, as it was confirmed on glycine, dipeptide and tripeptide. The results give rise to the problem of a revision of the entire system of interpretation of peptide- and protein-sorption processes of amino acids.

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The Mechanism Underlying the Sorption of Dipolar Ions by Ionites. 20-2-43/62

They open up new possibilities of a selective separation of dipolar ions from all others (e.g. by employment of two filters with resins in salt and hydrogen form). A great number of varieties can be proposed together with the method of a selective sorption of dipolar ions.

(2 illustrations, 2 tables)

ASSOCIATION Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR

PRESENTED BY REBINDER P.A., Member of the Academy, Feb 6, 1957

SUBMITTED

AVAILABLE Library of Congress

Card 3/3

G.V. Samsonov

5(O)
AUTHOR: None Given
TITLE: General Meetings of the Department of Chemical Sciences of the Academy of Sciences, USSR, on October 23 and November 27-28, 1959 (Obshchiye sobraniya Otdeleniya Khimicheskikh Nauk Akademii Nauk SSSR 23 oktyabrya i 27-28 noyabrya 1959 g.)
PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, 1959, Nr 5, pp 564-568 (USSR)
ABSTRACT:

This is a report on the General Meetings of the Department of Chemical Sciences, AS USSR. On October 23, 1959 the General Meeting of the Department of Chemical Sciences of the AS USSR took place under the chairmanship of Academician N. N. Serenkov. The Department delivered a lecture on the "Investigations in the Field of Tellurium Chemistry". She emphasized the fact that the field of tellurium has considerably increased in the course of the last years because of the valuable semiconductor properties of tellurium and its compounds. In her lecture Novoselova reported on the production of pure tellurium, on the investigations of the behavior of tellurium and on investigations of numerous tellurides. The lecture was asked numerous questions. M. A. Poray-Koshits, Candidate of Physical and Mathematical Sciences, spoke on the "Stereochimistry of Complex Compounds of Bivalent Nickel". On the basis of direct X-ray structural analyses carried out in the Institute of Chemistry of the Academy of Sciences of the USSR (Institute of General and Inorganic Chemistry, AS USSR) and the WUN it was found that all ammonia thiocyanate compounds of nickel which are separated from the solution at different concentrations represent, according to their structural character, complex six-coordination compounds. The analysis of the crystalline structures makes it possible to set up common crystallochemical rules in the series of ammonia thiocyanate compounds. O. B. Botiy and S. Z. Roginskiy, Corresponding Members, AS USSR, took part in the discussion. M. G. Gonik-berg, Doctor of Chemical Sciences spoke on the "Application of the Theory of the Mechanism of Reaction". By means of x-ray pressure measurements he proved that the application of high pressure opens new prospects in this field. S. N. Luginskiy and V. V. Deryagin, Corresponding Members, AS USSR, M. A. Penkin and A. I. Kityagorskiy, Doctors of Chemical Sciences took part in the discussion. S. M. Danilov, Corresponding Member, AS USSR, spoke on the "Properties of Low-Substituted Cellulose Nitrate and Their Solutions". The following scientists took part in the discussion: S. M. Danilov, Corresponding Member, O. P. Golova, Doctor of Chemical Sciences, et al. G. V. Samsonov, Doctor of Chemical Sciences spoke on the "Specific Sorption of Ions of Organic Substances". The synthesis of weakly swelling ion-exchange resins, which cannot absorb certain ions of organic substances allow the establishment of a new effective method of producing chemically pure streptomycin and penicillin. The lecturer was asked many questions. M. V. Volkenshteyn, Doctor of Physical and Mathematical Sciences dealt with the "Problems of Statistical Physics of Polymers". The lecturer and his collaborators have developed a general statistical method of computing the properties of macromolecules which is based on the application of the Boltzmann transfer model. The following scientists took part in the discussion: M. V. Volkenshteyn, Doctor of Chemical Sciences B. V. Deryagin and V. G. Litvinchikov, Corresponding Members, AS USSR. Y. K. Zavalov, Doctor of Physical and Mathematical Sciences spoke on the "Intermolecular Interaction and the Form of Macromolecules in Solutions". The lecturer demonstrated that the molecular weight of the fraction may be determined by a joint determination of the characteristic viscosity and diffusion. B. V. Deryagin, Corresponding Member, AS USSR, M. V. Volkenshteyn, Doctor of Physical and Mathematical Sciences and A. I. Kityagorskiy, Doctor of Chemical Sciences took part in the discussion.

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SAMSONOV, G.V.; DMITRENKO, L.V.; SIROTA, A.G.; GORYUNKOVA, A.D.; MOROZOVA, I.G.;
KLIKH, S.F.; SHESTERIKOVA, M.P.

Purification of albomycin by using chromatographic method on sulfo-
cationites. Antibiotiki 3 no.2:90-94 Mr-Apr '58. (MIRA 12:11)

1. Leningradskiy khimiko-farmatsevticheskiy institut, i Institut
vysokomolekulyarnykh soedineniy AN SSSR.

(ANTIBIOTICS,

albomycin, chromatographic purification with sulfo-
cation exchange resistance (Rus))

(ION EXCHANGE RESINS,

sulfo-cation exchange resin SDV-3, chromatographic
purification of albomycin (Rus))

SAMSONOV, G.V., EL'KINA, E.I., EL'KIN, G.E., KAN, A.M. (Leningrad)

Studies on the process of sorption and purification of oxytetracycline
with the aid of ion-exchange resins. [with summary in English].
Antibiotiki, 3 no.3:30-35 My-Je '58 (MIRA 11:7)

(OXYTETRACYCLINE, preparation of
sorption & purification with ion-exchange resins (Rus))
(ION EXCHANGE RESINS,
sorption & purification of oxytetracycline (Rus))

SAMSONOV, G.V.; KHINTS, A.A.; SALAMATINA, V.P.

Complete demineralization of streptomycin based on a molecular sieve method. Antibiotiki 3 no.6:27-29 N-D '58. (MIRA 12:2)

1. Institut vysokomolekulyarnykh soyedineniya AN SSSR, Leningrad.
(STREPTOMYCIN,
demineralization, molecular sieve method (Rus))

SAMSONOV, G. V.

with R. B. Ponomareva and L. V. Dmitrenko "Particulars on the chromatographic
purity determination of protein"

report presented at the 10th All-Union Conf. on Highly Molecular Compounds,
Biologically Active Polymer Compounds, Moscow, 11-13 June 1958. (Vest.Ak
Nauk SSSR, 1958, No. 9, pp. 111-113)

AUTHORS: Samsonov, G.V., Kuznetsova, N.P. 69-58-2 -14/23

TITLE: The Isotherms of Amino Acids Sorption on Hydrogen Forms of Ion Exchange Resins (Uravneniye izotermy sorbtsii aminokislot na vodorodnykh formakh ionoobmennyykh smol)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 2, pp 209-213 (USSR)

ABSTRACT: The exchange of dipolar amino acid ions with other ions and especially with hydrogen ions led to the conclusion that dipolar ions can be adsorbed in considerable quantities only if they are transformed into cations. An ion exchange which is different from the exchange of metal ions needs another exchange equation. In this article, a thermodynamic derivation of this equation for amino acids with hydrogen ions on sulforesins is given. The equation has been verified for the system alanine-hydrogen on the sulforesin SDV-3. Figure 1 shows that the sorption process of alanine in the hydrogen form of the resin SDV-3 is subjected to the mentioned equation. The increase of alanine in the concentration leads to an increase of the quantity of adsorbed alanine (figure 3). An increase of the concentration increases the limit quantity of the adsorbed alanine to 4.1 mg/g. The cations of the amino acid alanine are adsorbed

Card 1/2

69-58-2 -14/23

The Isotherm of Amino Acids Sorption on Hydrogen Forms of Ion Exchange Resins

with a very low degree of selectivity.
There are 3 graphs and 3 references, 2 of which are Soviet,
and 1 English.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad
(Institute of High-Molecular Compounds of the USSR Academy
of Sciences, Leningrad)

SUBMITTED: January 12, 1957

1. Ions--Exchange
2. Amino acids--Ions--Applications
3. Hydrogen--Ions--Applications
4. Alanine--Adsorption

Card 2/2

SAMSONOV, G.V., DMITRIYENKO, L.V., SIROTA, A.G., SHESTERIKOVA, M.P.,
LEVRENT'YEVA, S.F.

Physicochemical properties of albomycin [with summary in English]
Biokhimiia 23 no.2:220-224 Mr-Apr '58 (MIRA 11:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Khimiko-
farmatsevticheskiy institut, Leningrad.
(ANTIBIOTICS,

albomycin, physicochem. properties (Rus))

5(3)

PHASE I BOOK EXPLOITATION

SOV/2995

Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk. Komissiya po khromatografii

Ionnyy obmen i yego primeneniye (Ion Exchange and Its Application)
Moscow, Izd-vo AN SSSR, 1959. 318 p. Errata slip inserted.
4,000 copies printed.

Ed.: K. V. Chmutov, Corresponding Member, USSR Academy of Sciences;
Eds. of Publishing House: T. G. Levi and N. G. Yegorov; Tech.
Ed.: G. N. Shevchenko.

PURPOSE: This book is intended for factory and scientific research laboratory personnel, engineers, teachers and advanced students at vuzes concerned with the study of ion-exchange processes.

COVERAGE: This collection of seven articles treats the principal trends in the investigation and application of ion-exchange processes in heterogeneous media, and reviews the present state of ionite synthesis and application. No personalities are mentioned. References are given at the end of each article.

Card 1/3

Ion Exchange (Cont.)

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Card 2/3

SAMSONOV, G.V.; BASHKOVICH, A.P.

Ion exchange methods for the separation and purification of the tetracycline group of antibiotics. Med.prom. 13 no.10:5-13 '59.

(MIRA 13:2)

1. Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR i Leningradskiy khimiko-farmatsevticheskiy institut.

(ION EXCHANGE)

(TETRACYCLINE)

5(4)

SOV/69-21-4-16/22

AUTHOR: Samsonov, G.V., Boltaks, Yu.B., Kaznetsova, N.P., Bashkovich, A.P., Ponomareva, R.B.

TITLE: Sorption of Iones by Carboxyl Resins in the Hydrogen Form

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol XXI, Nr 4, pp 471-475 (USSR)

ABSTRACT: This study is devoted to the problem of slow sorption of cations in aqueous solutions by carboxyl resins in the hydrogen form. The authors' experiments considered two assumptions concerning the nature of this phenomenon. The first of these explains the phenomenon with the slow diffusion of desorbed hydrogen ions from the ionite grains into the solution. The second assumption considers the slow rate of diffusion of streptomycin into the grains of the carboxyl cationite in the hydrogen form as the most delayed stage of the process. In order to verify the second assumption, the authors studied the sorption of streptomycin on two samples of carboxyl resin KMT, synthesized by A.A. Vansheydt, A.V. Okhrimenko and A.V. Tunik. The results of the experiments (table 1) fully exclude the possibility to explain

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Sorption of Iones by Carboxyl Resins in the Hydrogen Form

the slow sorption of cations by little porosity of resins of the mentioned type or by difficulties for streptomycin ions to diffuse into the resin grains. The first assumption was largely confirmed by the experiments. Figure 2 (graph) shows a nearly perfect coincidence of the curves of sorption of streptomycin and sodium by the carboxyl cationite KB 4 P-2 in hydrogen form from solutions of equal concentrations. The sorption process developed in the presence of an OH-anionite. Table 2 shows an increase of the sorption capacity of KMT resin for streptomycin cations in buffer (pH 4-6) and Na_2SO_4 solutions. Table 3 shows the sorption capacity of carboxyl resins in hydrogen and sodium form for several albumins. The data proves that on the whole carboxyl resins in hydrogen form absorb albumins better than the same carboxyl resins in sodium form. The results of the experiments can be summarized as follows. The low sorption capacity of carboxyl resins in the hydrogen form for cations is determined by the low rate of diffusion of hydrogen ions from the

Card 2/5

SOV/69-21-4-16/22

Sorption of Iones by Carboxyl Resins in the Hydrogen Form

ionite grain into the solution. The characteristics of the sorption of cations by carboxyl resins can be observed during the sorption of metal ions as well as during the sorption of ions of larger size. Bipolar ions can be absorbed by carboxyl resins in hydrogen form, as there is no passing of hydrogen ions into solution during this process (details concerning bipolar ion sorption on page 474). There are 3 graphs, 3 tables and 5 references, 4 of which are Soviet and 1 English.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad
(Institute of High-Molecular Compounds of the AS USSR), Leningrad)

SUBMITTED: 8 April, 1958

Card 3/3

EXCERPTA MEDICA Sec 2 Vol 12/11 Physiology Nov 59

5022. PROTEIN SORPTION BY ION-EXCHANGE RESINS (Russian text) - Samsonov G. V. and Ponomareva R. B. Inst. of High Polymers, Acad. of Sci. of the USSR, Leningrad - BIOKIMIYA 1959, 24/1 (63-66) Graphs 4 Tables 3

Protein sorption by ion-exchange resins is effected by the same mechanism as that of more simple bipolar ions, such as amino-acids and peptides. Some proteins are similar to amino-acids in their sorption while others, in which the distance between the carboxyl and amino groups is great, are sorbed like peptides. Thus protein sorption indicates the distance between the amino and carboxyl groups on the protein globule.

5 (4)

AUTHORS:

Samsonov, G. V., Vedeneyeva, V. V.,
Selezneva, A. A.

SOV/20-125-5-35/63

TITLE:

The Sorption of Penicillin by Polymeric Sorbents
(Sorbtsiya penitsillina polimernymi sorbentami)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 3,
pp 591-594 (USSR)

ABSTRACT:

Penicillin is a rather acid substance (the ionization constant of benzylpenicillin is equal to 2.7). Penicillin, therefore, can be sorbed on anionites, for instance on weak anionites prepared by condensation of metaphenyldiamine, and also on strong anionites the synthesis of which is based on the chloro-methylation of styrene and on the interaction of the resulting product with tertiary amines. Notwithstanding the significant absorptive power of penicillin by various anionites, the process of its ion-exchange purification was inhibited in a very essential way. According to a table given by the authors, the irreversible sorption of penicillin from the culture liquid is mainly caused by the existence of anions of sulphuric, phosphoric, and some other acids in the solution. The sorption of

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The Sorption of Penicillin by Polymeric Sorbents

SOV/20-125-3-35/63

penicillin becomes almost a complete one after the precipitation of these anions by barium salts (although the sorption capacity does not increase very much). The complicated character of the interaction of penicillin with the anionite requires the investigation of the possibility of applying the principal laws of anion exchange to this phenomenon. In this case, there is an equivalence of the ion exchange: The number of moles desorbed from the anionite EDE-10 of chlorine ions is equal to the number of moles of sorbed penicillin. The desorption of penicillin from anionites can be carried out in a practically complete yield if solutions of phosphate and sodium sulphate are used. The application of the anion-exchange method to the separation and purification of penicillin is based on the above-discussed principles of reversible selective sorption of penicillin and its desorption from anionites. The choice of the anionites is important for this process. The influence of the anions of sulphuric and phosphoric acid upon the reversibility of the sorption of penicillin was explained by the formation of additional bonds between sorbed penicillin and sorbed anions. According to investigations of the authors, penicillin is sorbed with a

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The Sorption of Penicillin by Polymeric Sorbents

SOV/20-125-3-35/63

high capacity by sulpho-cationites, and also by phosphorus and carboxyl cationites. The fact that penicillin is sorbed by cationites as a result of interaction of its peptide group with the sorbent, may be taken into account for the purification of penicillin from other acids. The specific sorption of penicillin by cationites is one of the most efficient processes for its purification. The authors thank V. N. Nikitin and Ye. I. Pokrovskiy who took the infrared spectra. There are 3 figures, 3 tables, and 7 references, 3 of which are Soviet.

ASSOCIATION: Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR (Institute of High-molecular Compounds of the Academy of Sciences USSR) Leningradskiy khimiko-farmatsevticheskiy institut (Leningrad Chemical-pharmaceutical Institute)

PRESENTED: December 12, 1958, by M. M. Shemyakin, Academician

SUBMITTED: December 3, 1958

Card 3/3

SAMSONOV, Georgiy Vasil'yevich; FRENKEL', S.Ya., otv.red.; ROTENBERG,
A.S., red.izd-va; ZAMARAYEVA, R.A., tekhn.red.

[Sorption and chromatography of antibiotics] Sorbttsia i khroma-
tografiia antibiotikov. Moskva, Izd-vo Akad.nauk SSSR, 1960.
175 p.. (MIRA 13:11)
(SORPTION) (CHROMATOGRAPHIC ANALYSIS) (ANTIBIOTICS)

SAMSONOV, G.V.; YML'KIN, G.E.; KLIKH, S.F.; BAKAYEVA, R.M.; KARPENKO, M.P.

Selective sorption of vitamin B₁₂ in ionites. Med.prom. 14
no.3:3-12 Mr '60. (MIRA 13:6)

1. Leningradskiy khimiko-farmatsevticheskiy institut.
(CYANOCOBALAMINE) (ION EXCHANGE)

SAMSONOV, G.V.

Reversibility of sorption of antibiotics and other organic substances
by ion exchange resins. Med. prom. 14 no.7:16-21 Je '60.

(MIRA 13:8)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(ANTIBIOTICS) (SORPTION) (ION EXCHANGE)

SAMSONOV, G.V.; GLIKINA, M.V.; PONOMAREVA, R.B.; YURCHENKO, V.S.; GUDKIN,
L.R.; KUZNETSOVA, N.P.; DMITRENKO, L.V.; ZAYTSEVA, A.D.

Transformations of polypeptides and synthesis of the peptide bond
on ion exchange resins. Biokhimiia 25 no.5:964-973 8-0 '60.
(MIRA 14:1)

1. Institute of High Polymer Compounds, Academy of Sciences of the
U.S.S.R., Leningrad.
(ION EXCHANGE) (PEPTIDES)

YEL'KIN, G.E.; KLIKH, S.F.; SAMSONOV, G.V.

Frontal chromatographic method of purifying vitamin B₁₂. Zhur. prikl.
khim. 33 no.6:1397-1403 Je '60. (MIRA 13:8)
(Cyanocobalamine)

SAMSONOV, G. V., GLIKINA, M. V., PONOMAREVA, R. B., and YURCHENKO, V. S.
(USSR)

"The Synthesis of Peptide Bond on the Ion Exchange Resins."

Report presented at the 5th International Biochemistry Congress,
Moscow, 10-16 Aug 1961

SAMSONOV, G.V.

Sorption and chromatography of macromolecular compounds. Usp.khim. 30
no.11:1410-1423 N '61. (MIRA 14:10)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(Macromolecular compounds) (Chromatographic analysis)

SAMSONOV, G.V.

Thermodynamic theory of the selective sorption of ions as a basis
for ion exchange methods of purifying medicinal substances. Trudy
Len.khim.-farm.inst. no.15:9-14 '62. (MIRA 15:11)
(ION EXCHANGE) (DRUGS)

SAMSONOV, G.V.; VEDENEYEVA, V.V.; SHATIK, V.V.; VIKHOREVA, T.A.

Study of the conditions for the reversibility of the sorption of penicillin sorbed in the presence of sulfates and phosphates on the nonselective sorbing EDE-10 anion exchanger. Trudy Len.khim.-farm.inst. no.15:75-80 '62. (MIRA 15:11)

(PENICILLIN)

(ION EXCHANGE)

(SORPTION)

SAMSONOV, G.V.; VEDENEYEVA, V.V.; KIM DYU-CHIR

Anion exchange of penicillin with other anions in nonaqueous
solutions. Trudy Len.khim.-farm.inst. no.15:81-92 '62.
(MIRA 15:11)

(PENICILLIN) (ION EXCHANGE)

SAMSONOV, G.V.; VEDENEYEVA, V.V.; ZAV'YALOVA, L.N.; VIKHOREVA, T.A.

Ion exchange sorption of penicillin with anion exchangers with
different swelling capacities. Trudy Len.khim.-farm.inst.
no.15:93-100 '62. (MIRA 15:11)

(PENICILLIN) (ION EXCHANGE)

SAMSONOV, G.V.; SELEZNEVA, A.A.; VAN I-GUAN [Wang I-kuang]

Characteristics of the absorption of penicillin by ion exchange
resins in relation to supplementary sorptive interaction. Trudy
Len.khim.-farm.inst. no.15:101-104 '62. (MIRA 15:11)

(PENICILLIN)
(ION EXCHANGE RESINS)

SAMSONOV, G.V.; BASHKOVICH, A.P.; GVOZDEVA, V.G.; MOISEYENKO, L.A.

Effect of the nature of the anions on the cation exchange of
antibiotics of the tetracycline series. Trudy Len.khim-farm.
inst. no.15:185-190 '62. (MIRA 15:11)
(ION EXCHANGE) (TETRACYCLINE)

SAMSONOV, G.V.; VOROB'YEVA, V.Ya.

Sorption of chlortetracycline by anion exchange resins. Trudy
Len.khim.-farm.inst. no.15:191-194 '62. (MIRA 15:11)
(CHLORTETRACYCLINE) (ION EXCHANGE RESINS) (SORPTION)

SAMSONOV, G.V.; VOROB'YEVA, V.Ya.; KONDRAT'YEVA, N.N.; GALKINA, O.A.

Sorption of albomycin by anion exchangers; report No. 1. Trudy
Len.khim.-farm.inst. no.15:197-203 '62. . (MIRA 15:11)
(ALBOMYCIN) (ION EXCHANGE RESINS)

SAMSONOV, G.V.,; VOROB'YEVA, V.Ya.

Frontal process of albomycin sorption on anion exchangers; report
No. 2. Trudy Len.khim.-farm.inst. no.15:205-209 '62.

(MIRA 15:11)

(ALBOMYCIN)

(ION EXCHANGE RESINS)

(CHROMATOGRAPHIC ANALYSIS)

SAMSONOV, G.V.; YEL'KIN, G.E.; GITMAN, A.I.

Frontal displacement chromatography of albomycin on cation
exchange resins. Trudy Len.khim.-farm.inst. no.15:211-219 '62.

(MIRA 15:11)

(ALBOMYCIN) (CHROMATOGRAPHIC ANALYSIS)
(BASE-EXCHANGING COMPOUNDS)

SAMSONOV, G.V.; SIRENKO, L.M.

Catalytic decomposition of albomycin on the SDV-3 ion exchange
resin. Trudy Len.khim.-farm.inst. no.15:221-223 '62. (MIRA 15:11)

(ALBOMYCIN) (ION EXCHANGE RESINS)

SAMSONOV, G.V.; FLEYER, L.P.

Study of the sorption of erythromycin by cation exchange resins.
Trudy Len.khim.-farm.inst. no.15:225-232 '62. (MIRA 15:11)
(ERYTHROMYCIN) (BASE-EXCHANGING COMPOUNDS)

SAMSONOV, G.V.; BOSAK, L.L.

Substitution of cations in benzylpenicillin on ionites. Med.prom.
16 no.7:32-34 J1 '62. (MIRA:9)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
(PENICILLIN) (ION EXCHANGE RESINS)

SAMSONOV, G.V.

Sorption and chromatography of macromolecular substances. Analele
chimie 17 no.2:18-33 Ap-Je '62.

SAMSONOV, G. V.; PASECHNIK, V. A.

Variation in the thermodynamic potential of ion exchange
resins during ion exchange. Zhur. fiz. khim. 36 no.12:2727-
2733 D '62. (MIRA 16:1)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

(Ion exchange resins)

SAMSONOV, G.V.; SELEZNEVA, A.A.

Thermodynamic theory of the sorption of ions of organic substances. Dokl. AN SSSR 143 no.4:919-921 Ap '62. (MIRA 15:3)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.
Predstavleno akademikom A.N.Frumkinym.
(Ion exchange) (Sorption)

SAMSONOV, G.V.; KUZNETSOVA, N.P.; MOSKVICHEV, B.V.

Change in thermodynamic functions during the sorption of amino acids
by sulfo resins in hydrogen form. Izv. AN SSSR. Ser.khim. no.3:
578-580 Mr '64. (MIRA 17:4)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR.

NESHPOR, V.S.; SAMSONOV, G.V.

Investigating the structure and certain physical properties of alloys of the isomorphous disilicides of molybdenum and rhenium. Fiz. met. i metalloved. 18 no.2:187-192 Ag '64.

(MIRA 18:8)

1. Sektor tugoplavkikh materialov Instituta problem materialovedeniya AN UkrSSR.

SAMSONOV, G.V.; PONOMAREVA, R.B.

Study of electrochemical structure of protein molecules and
their fragments by sorption methods. Biokhimiia 29 no.4:
586-589 J1-Ag '64. (MIRA 18:6)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR, Leningrad.

SAMSONOV, G.V.; BASHKOVICH, A.P.

Correlations in the ion-exchange sorption of antibiotics of
the tetracycline series over a wide pH range. Koll. zhur. 26
no.5:613-616 S-O '64. (MIRA 17:10)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Lenin-
gradskiy khimiko-farmatsevticheskiy institut.

SAMSONOV, G.V.

Classification of carbides. Ukr. Khim. zhur. 31 no.10:
1005-1015 '65. (MIRA 19:1)

1. Institut problem materialovedeniya AN UkrSSR. Submitted
March 25, 1964.

SAMSONOV, G.V.

Role of stable electronic configurations in forming the properties
of chemical elements and compounds. Ukr. khim. zhur. 31 no. 12:
1233-1247 '65 (MIRA 19:1)

1. Institut problem materialovedeniya AN UkrSSR. Submitted
April 4, 1965.

MAT'TSEVA, L.F.; LAPSHOV, Yu.K.; MARMER, E.N.; SAMSONOV, G.V.

High temperature heating elements of niobium and zirconium
carbide. Porosh.met. 5 no.11:87-93 N '65.

(MIRA 18:12)

1. Institut problem materialovedeniya AN UkrSSR i Vsesoyuznyy
nauchno-issledovatel'skiy institut elektrotermicheskogo
oborudovaniya. Submitted March 4, 1965.

L 38733-66 EWT(m)/EWP(k)/EWP(t)/ETI/EWP(e) IJP(c) JG/WW/JD

ACC NR: AP6008799

SOURCE CODE: UR/0021/65/000/010/1317/1321

AUTHOR: Samsonov, H. V. — Samsonov, G. V. (Corresponding member AN UkrSSR);
Ohanesyan, V. Kh. — Oganesyan, V. Kh.

ORG: Institute of Problems in the Science of Materials, AN URSR (Instytut problem materialoznavstva AN URSR)

TITLE: Physical properties of some sulfides of transition metals

SOURCE: AN UkrRSK. Dopovidi, no. 10, 1965, 1317-1321

TOPIC TAGS: sulfide, transition element, metal physical property, solid physical property, electric property, Hall effect, *SEMICONDUCTIVITY*

ABSTRACT: The authors study the physical and electrical properties (electrical resistance, thermal e. m. f., Hall effect, thermal conductivity and microhardness) of TiS, TiS₃, ZrS₂, Nb₂S₃, Cr₂S₃, MoS₂ and FeS. Powder specimens of TiS, Nb₂S₃, Cr₂S₃ and MoS₂ were hot-pressed in an argon atmosphere in molds made from graphite. The samples were pressed for 5 minutes at various temperatures depending on the metal: TiS—1200°, Nb₂S₃—1700°, Cr₂S₃—1300° and MoS₂—1100°. The Ti₂S₃, ZrS₂ and FeS specimens were produced by burning preformed briquettes in H₂S at 1200-1300° for 1 hr. The experimental data show that an increase in the acceptor capacity of the d-electron sublevels in the transition metals is accompanied by an increase in the relative sulfur

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ACC NR: AP6008799

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concentration at which the transition from metallic to semiconductor type conductivity takes place in the sulfide phase. A boundary curve is given showing the region of metallic and semiconductor chalcogenides, as a function of the content of chalcogens and the acceptor capacity of the transition metals. The transition from metallic TiS to semiconductive Ti_2S_3 is accompanied by a reduction in thermal conductivity and microhardness. However, the presence of some residual hardness indicates that the width of the forbidden zone is relatively narrow as compared with ZrS_2 and MoS_2 . Cr_2S_3 , MoS_2 and ZrS_2 are apparently typical semiconductors, while FeS is nanologous to Ti_2S_3 which is located on the boundary between metallic and semiconductor bonding. Orig. art. has: 2 figures, 1 table.

SUB CODE://,20/ SUBM DATE: 02Sep64/ ORIG REF: 006/ OTH REF: 002

Card 2/2

L 35833-66 EWT(1) IJP(c) AT

ACC NR: AP6015900. (N) SOURCE CODE: UR/0073/65/031/012/1233/1247

AUTHOR: Samsonov, G. V.

58
B

ORG: Materials Institute, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Role of the formation of stable electron configurations in determining the properties of chemical elements and compounds

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 31, no. 12, 1965, 1233-1247

TOPIC TAGS: electron distribution, ionization potential, chemical compound, metal melting, electric resistance

ABSTRACT: The article is a long theoretical discussion of the subject and is not based on new experimental data. A figure shows the dependence of the melting temperature of metals on the number of electrons in the d-orbits of isolated atoms. Another figure shows the dependence of the electrical resistance of the alkali metals on the ionization potential. A table shows in detail the melting temperatures, the hardness, and the width of the forbidden bands for sp-elements of the IV and VII groups. Further tables show the melting temperatures of oxides of the metals of the II group, and the physical properties of type A^{III}B^V semiconductors. Orig. art. has: 3 figures and 3 tables.

SUB CODE: 0720/ SUBM DATE: 04Apr65/ ORIG REF: 017/ OTH REF: 007

Card 1/1 *ms*

38548 86
ACC NR:

AT6014751

electron acceptors, are not, as a rule, superconductors, but nitrides of even strong acceptors, in which the transfer of the valence electrons of nitrogen for filling the d-shells becomes less probable, show superconductivity, as a rule. It is concluded that systematization of the experimental data will make it possible to designate the most probable areas for seeking new high-melting superconductors. Orig. art. has: 2 tables and 3 graphs.

SUB CODE: 11, 20/ SUBM DATE: 23Dec65/ ORIG REF: 011/ OTH REF: 008

Card

2/2

L 16805-66 EWT(m)/EWP(t) LJP(c) JD/JG

ACC NR: AP6003370 (A) SOURCE CODE: UR/0363/66/002/001/0128/0132

AUTHOR: Samsonov, G. V.; Podchernyayeva, I. A.

ORG: Institute of Materials Science Problems, Academy of Sciences UkrSSR
(Institut problem materialovedeniya Akademii nauk UkrSSR)

TITLE: On the emissive properties of alkaline earth oxides

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 1, 1966, 128-132

TOPIC TAGS: alkaline earth oxide, work function, transition metal, electron structure

ABSTRACT: The thermoemissive and certain other physical properties (melting point, forbidden gap width) of alkaline earth oxides are discussed. It is shown that all these properties are determined by the distribution of the valence electrons of the metal between the oxygen atoms (with the formation of s^2p^6 configurations), and by hybrid sp states and d states (for alkaline earth metals). The thermoemissive properties of oxide cathodes consisting of a film of alkaline earth oxide on a transition metal backing are considered, and it is shown that the work function in thermoemission is determined by the nature of the interaction between the oxide and the metal of the backing. It was found that the conditions for a low work function of an oxide cathode are a maximum

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UDC 546.422-31:537.581

L 16805-65

ACC NR: AP6003370

probability of formation of a high statistical weight of d^5 electron configurations by the transition metal atoms of the backing at a simultaneous moderate concentration of collectivized electrons, and also a maximum transfer of s electrons of the alkaline earth metal to d states and their minimum binding in hybrid sp configurations. These conditions suggest ways of further improving oxide cathodes. Orig. art. has: 1 figure.

SUB CODE: 11, 20 / SUBM DATE: 12Jul65 / ORIG REF: 007 / OTH REF: 001

Card 2/2 inc

L 35866-66 EWP(e)/EWT(m)/EWP(w)/I/EWP(t)/ETI IJP(c) JD/JG
 ACC NR: AP6020958 (A) SOURCE CODE: UR/0226/66/000/006/0017/0023 45
 3

AUTHOR: Samsonov, G. V.; Lapshov, Yu. K.; Podchernyayeva, I. A.;
 Fomenko, V. S.; Yerosov, Yu. I.; Dudnik, Ye. M.

ORG: Institute of the Problems of Material Science, AN UkrSSR (Institut
 problem materialovedeniya AN UkrSSR)

TITLE: Production and physical properties of alloys of the W-LaB₆ system
 17-11

SOURCE: Poroshkovaya metallurgiya, no. 6, 1966, 17-23.

TOPIC TAGS: tungsten base alloy, lanthanum hexaboride containing
~~alloy~~, tungsten boride ~~containing alloy~~, ~~alloy~~ physical property,
~~alloy phase diagram~~, x-ray diffraction analysis

ABSTRACT: Six tungsten-base alloys containing 1, 3, 5, 10, 30 or
 50 mol% lanthanum hexaboride were prepared from alloy powder with a
 particle size of 50 μ by hot compacting in an argon atmosphere in
 graphite molds coated with boron nitride. It was found that the
 reaction of tungsten with lanthanum hexaboride results in decomposition
 of the latter and in the formation of W₂B and WB borides. Metallo-
 graphic and x-ray diffraction analysis showed that alloys containing
 1, 3, or 5% lanthanum hexaboride had a two-phase structure consisting
 of tungsten-base solid solution and tungsten boride (W₂B) and a micro-
 hardness of 620, 597, and 535 dan/mm², respectively. Alloy with 10%

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L 35866-66

ACC NR: AP6020958

lanthanum hexaboride had a four-phase structure consisting of tungsten-base solid solution, W_2B , WB , and LaB_6 -base phase. Alloys with 30 or 50% lanthanum hexaboride contained two W_2B -base and LaB_6 -base phases. The alloys containing 1, 3, 5 and 10% lanthanum hexaboride have a resistivity at room temperature of 6.9, 17.75, 23.1, and 41.6 kohm-cm, respectively. Small additions of lanthanum hexaboride (about 1 mol%) sharply reduced the work function of tungsten at 1700C. These alloys appear to be promising materials for cathodes working at medium and high temperatures. Orig. art. has: 7 figures and 1 table. [AZ]

SUB CODE: 11/ SUBM DATE: 27Dec65/ ORIG REF: 017/ OTH REF: 003

ATD PRESS: 5036

Card 2/2 11-

L 45299-66 EWI(m)/EWP(t)/ETI IIP(c) JD
ACC NR: AP6020959 SOURCE CODE: UR/0226/66/000/006/0041/0051

AUTHOR: Perminov, V. P.; Samsonov, G. V.

ORG: Institute of Physicochemical Fundamentals for Processing Mineral Raw Materials, AN SSSR (Institut fiziko-khimicheskikh osnov pererabotki mineral' nogo syr' ya AN SSSR); Institute for Problems in the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN USSR)

TITLE: Metal chemistry of magnides

SOURCE: Poroshkovaya metallurgiya, no. 6, 1966, 41-51

TOPIC TAGS: magnēsiūm, magnesium compound, binary magnesium compound, magnide

ABSTRACT: The metal and chemical dependences in binary magnides have been investigated in consideration of the effect of the formation of stable electronic configurations on the properties of chemical elements and compounds. All elements of the periodic system are divided into three families, each having a characteristic

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L 45299-66

ACC NR: AP6020959

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interaction with magnesium. The nature of Mg interaction with a number of elements and the probability of magnide formation in binary systems has been assumed without a detailed study. Orig. art. has: 2 tables. [Based on authors' abstract]

[NT]

SUB CODE: 11/ SUBM DATE: 15Mar66/ ORIG REF: 013/- OTH REF: 009/

Card

2/2

L 46670-66 EWT(m)/EWP(k)/T/EWP(e)/EWP(w)/EWP(t)/ETI IJP(c) AT/WH/HW/JD/HW/JG
 ACC NR: AP6009580 (N) SOURCE CODE: UR/0226/65/000/011/0087/0093:

AUTHOR: Mal'tseva, L. F.; Lapshov, Yu. K.; Marmer, E. N.; Samsonov, G. V. ⁷⁶⁷¹ _{B'}

ORG: Institute for the Study of Materials, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR); All-Union Scientific Research Institute of Electrothermal Equipment (Vsesoyuznyy nauchno-issledovatel'skiy institut elektrotermicheskogo oborudovaniya) ²⁷ ₂₇ ₂₇

TITLE: High-temperature heaters constructed from the carbides of niobium and zirconium

SOURCE: Poroshkovaya metallurgiya, no. 11, 1965, 87-93

TOPIC TAGS: furnace heater, carbide, metal powder, niobium compound, zirconium compound, refractory metal, metallurgic furnace

ABSTRACT: The article deals with the experimental investigation of the suitability of niobium and zirconium carbides as substitutes for the refractory metals W, Ta and Mo used as furnace heaters and linings, since the latter metals do not satisfy the requirements of present-day furnace technology so far as operation at temperatures of 2500-3000°C is concerned. (To assure operation at temperatures of 2500-3000°C the heater material must have a melting point of 3500-4000°C.) Tube- and rod-shaped heaters were prepared from NbC and ZrC

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ACC NR: AP6009580

by pressing the powders of these carbides into the corresponding shapes in a vertical press (tubes -- current leads -- measuring 150 mm in length, 11.2 mm in inside diameter and 25 mm in outside diameter; rods measuring 650 mm in length, and 11 mm in diameter), with subsequent drying and sintering. They were then tested by passing electric current directly through them at maximum temperatures. Findings: ZrC rods and tubes had to be rejected because, when in elongated form, these products readily crack during sintering. NbC rods and tubes withstood temperatures of up to 2300°C for 3-4 hr without fracturing or buckling. In one case even (thin tube with $d_{out} = 18$ mm, $d_{in} = 13$ mm, $l \sim 600$ mm), a temperature of the order of 2500-2600°C was successfully achieved and maintained for 7 hr. Thus, NbC is a promising material for use in resistance furnaces. It appears that the mechanical strength of these heaters could be further enhanced by adopting more effective pressing techniques, e.g. extrusion. Orig. art. has: 4 figures.

SUB CODE: 11,13/ SUBM DATE: 04Mar65/ ORIG REF: 007/ OTH REF: 002

Card hs
2/2

L 46603-66 EWT(m)/EWP(t)/ETI IJP(c) JD/JG/GD

ACC NR: AT6013573

(N)

SOURCE CODE: UR/0000/65/000/000/0437/0444

AUTHOR: Samsonov, G. V.; Strashinskaya, L. V.

ORG: Institute of Material Science Problems, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR)

TITLE: Solid phase surface reactions among borides¹, high melting metals^{2,1}, and ZrO₂²⁷

SOURCE: AN UkrSSR. Institut problem materialovedeniya. Vysokotemperaturnyye neorganicheskiye soyedineniya (High temperature inorganic compounds). Kiev, Naukova dumka, 1965, 437-444

TOPIC TAGS: ~~solid phase~~, boride, carbide, titanium, niobium, tantalum, molybdenum, tungsten, *HIGH TEMPERATURE METAL, HARDNESS, ZIRCONIUM COMPOUND, HEATING, METAL SURFACE*

ABSTRACT: The interaction between powdered borides (TiB₂¹, ZrB₂¹, TaB₂, Mo₂B₅, W₂B₅) and compressed high temperature metals (Nb¹, Ta¹, Mo¹, W¹) during heating for 5 hours at 1000°-2100°C and 5·10⁻² mm Hg and between hot-pressed TiB₂ and ZrB₂ with ZrO₂ for 2-5 hours at 1000°-1500°C and 5·10⁻² mm Hg was studied by metallographic and microhardness techniques. It was found that (depending upon the extent of interface diffusion) the microhardness of the new phase formed during boride-metal interaction varies within 1000-4000·10⁶ dyne/mm². It was found that of all the borides, TiB₂ interacted least with the high temperature metals. The dependence of the microhardness of tantalum bo-

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ACC NR: AT6013573

rides upon boron content is graphed. A table gives the temperatures at which the reaction among the borides, high temperature metals, and ZrO_2 in vacuum commences. Orig. art. has: 3 figures, 2 tables.

SUB CODE: 07, // / SUBM DATE: 03Jul65/ - ORIG REF: 002

Card 2/2

mjs

L 45975-66 EWT(m)/EWP(k)/EWP(e)/EWP(t)/ETI IJP(c) JD/JH

ACC NR: AR6028430

SOURCE CODE: UR/0137/66/000/005/G018/G018

AUTHOR: Neronov, V. A. ; Lamikhov, L. K. ; Samsonov, G. V. 21
B

TITLE: Optimization of the preparation of AlB_{12} by an out-of-furnace metallothermic process

SOURCE: Ref. zh. Metallurgiya, Abs. 5G132

REF SOURCE: Sb. Issled. v obl. khimii i tekhnol. mineral'n. soley i okislov. M. -L., Nauka, 1965, 308-311

TOPIC TAGS: boric anhydride, aluminum boride, metallothermic process, aluminothermic process ✓

ABSTRACT: The effect of the amount of gypsum as the preheating admixture, the amount of Al and preheating temperature of the charge has been analyzed on the process of aluminothermic preparation of AlB_{12} . Boric anhydride with 98% B_2O_3 , ground to a 0.15 mm particle size, Al powder, and 0.15 mm particle-size gypsum roasted at 700—800C for 2 hr were used as the starting material. The optimum conditions for obtaining AlB_{12} without the admixture of aluminum boride and the highest yield of B ($> 70\%$) are: preheating temperature of the charge—

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L 45975-66

ACC NR: AR6028430

540—580C; amount of gypsum in the charge—40. 25--50 g; and amount of Al—
74—78 g. G. Svordtseva. Bibliography of 8 titles. [Translation of abstract] [NT]

SUB CODE: 11/

hs

Card 2/2

L 44221-66 EWP(e)/EWT(m)/EWP(t)/ETI/EWP(k) IJP(c) JD/WW/JG
 ACC NR: AP6019751 SOURCE CODE: UR/0131/66/000/006/0055/0059

AUTHOR: Samsonov, G. V.; Dobrovol'skiy, A. G. 45

ORG: Institute of Problems of the Science of Materials, AN UkrSSR (Institut problem materialovedeniya AN UkrSSR) B

TITLE: Some problems concerning the technology of producing articles from silicon nitride 27

SOURCE: 27 Ogneupory, no. 6, 1966, 55-59

TOPIC TAGS: silicon nitride, silicon compound, fabricated structural metal, structural hardware

ABSTRACT: A comparison has been made of two methods for manufacturing silicon-nitride articles. In the first method, silicon powder is compacted into desired articles which are then sintered in nitrogen in two stages: first at 1250C and then at 1400-1600C. This method is economical since no expensive silicon nitride is used. However, only thin articles can be made by this method. In articles 25 mm thick, inclusions of pure silicon as large as 25 mm² were found. Heavy articles are made from silicon-nitride powder. However, the silicon-nitride powder is "hard-to-compact" and needs a plasticizer. Synthetic rubber dissolved in gasoline was found to be the most satisfactory plasticizer. Both methods yield sufficiently dense and strong articles. Some articles can be made by slip casting. Tubular articles are success- 16

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L 44221-66

ACC NR: AP6019751

fully made by the extrusion of plasticized silicon nitride powder. Generally, the strength of the silicon nitride articles does not depend on the method of manufacturing so much as on the temperature and duration of sintering. Orig. art. has: 4 figures. [FM]

SUB CODE: 11, 13/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 003

Card 2/2

L 46248-66 EWI(m)/EWP(w)/I/EWP(t)/ETI IJP(c) JD
 ACC NR: AP6023913 SOURCE CODE: UR/0363/66/002/007/1194/1199

AUTHOR: Samsonov, G. V.; Bazhenova, L. N.; Ivan'ko, A. A.

ORG: Institute of Materials Science Problems, Academy of Sciences, UkrSSR (Institut problem materialovedeniya Akademii nauk UkrSSR)

TITLE: On the correlation of certain physical properties of type AIII^{BV} and AII^{BVI} semiconductors

SOURCE: AN SSSR. Izv. Neorg materialy, v. 2, no. 7, 1966, 1194-1199

TOPIC TAGS: forbidden zone width, semiconductor crystal, electron structure

ABSTRACT: A correlation observed earlier between the forbidden gap width and the hardness of semiconductor compounds of types AIII^{BV} and AII^{BVI} and also their melting points was confirmed. It is shown that when these compounds are formed, a redistribution of electrons among the components takes place with the formation of energetically stable sp^3 and s^2p^6 configurations; the prevalence of sp^3 configurations leads to the formation of a sphalerite-type structure, and the prevalence of s^2p^6 , to a wurtzite-type structure. This is reflected to some extent in the physical properties of the semiconductors, owing to the great energetic stability of the s^2p^6 configurations as compared to sp^3 . As the principal quantum number of sp electrons increases, the energetic stability of the corresponding configurations declines; there is a corresponding increase in the fraction of collective and weakly bonded electrons, causing a decrease

UDC: 537.311.33

Card 1/2

Cc

blg

L 06579-67 EWT(m)/EWP(e)/EWP(w)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6029821

SOURCE CODE: UR/0363/66/002/008/1454/1459

AUTHOR: Samsonov, G. V.; Lapshov, Yu. K.; Podchernyayeva, I. A.; Fomenko, V. S.; Yerosov, Yu. I.; Dudnik, Ye. M.

ORG: Institute of Material Science Problems, Academy of Sciences SSSR (Institut problem materialovedeniya akademii nauk UkrSSR)

TITLE: Some physical properties of the W-LaB₆ alloys

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 8, 1966, 1454-1459

TOPIC TAGS: solid mechanical property, tungsten, boron, lanthanum, x ray, alloy, phase composition, phase diagram

ABSTRACT: The phase composition of several W-LaB₆ alloys (1-50 mole % LaB₆) was studied by x ray technique Microhardness, specific electrical resistivity in 293°-1273°K range, and thermal emission parameters and emanation coefficients in the 1200-1950°K range were determined for various W-LaB₆ alloys. The alloy samples were prepared by hot pressing of suitable W+LaB₆ mixture in an argon atmosphere. The x ray analyses were made with a URS-501M apparatus provided with CuKα-emission source. It was found that during the interaction between W and LaB₆ there occurs a simultaneous formation of two borides, W₂B and WB, and a decomposition of LaB₆. These processes were accompanied by an increase in the specific electrical resistivity of the samples. It was also

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L 06579-67

ACC NR: AP6029821

found that an addition of as little as 1 mole % LaB_6 to W results in a sharp decline in the samples work function. This effect is explained in terms of the declining statical weight of the stable d^5 - configurations in the tungsten atoms leading, in turn, to an easy thermal excitation of the metals' non-localized electrons. Orig. art. has: 5 figures and 3 tables.

SUB CODE: 11,20/SUBM DATE: 21Jul65/ ORIG REF: 015/ OTH REF: 002

Card 2/2

ACC NR: AP6019225

dissolved well in diluted and concentrated HCl and aqua regia, and was weakly soluble in H_2SO_4 at any concentration. The NdP was produced either from metallic Nd at 1100C and a 3 hr exposure to an Ar atmosphere, or from Nd_2O_3 at 1350C and a 3 hr exposure in H. The NdP powder had a black color, a nearly stoichiometric composition, was insoluble in H_2O , but dissolved in the same solvents as LaP; SnP of nearly stoichiometric composition was produced from metallic Sn at 900C after 7 hrs. of phosphidization, and from Sn_2O_3 at 900-1350C and 2-5 hrs. of phosphidization. From Sn_2O_3 the SnP was formed most efficiently at 1300-1350C. It was in the form of black powder which did not change during prolonged storage in air. The SnP dissolved well in HNO_3 of various concentrations, in HCl, and partly in H_2SO_4 . It did not dissolve in H_2O and alkaline solutions either cold or boiling. Thus, LaP, NdP, and SnP all dissolved well in diluted or concentrated HNO_3 . To keep the P in solution it was necessary to dissolve them in the presence of a strong oxidizer using either a mixture of HNO_3 with bromine water or diluted HNO_3 (1:1) saturated cold by $KBrO_3$ solution. Orig. art. has: 1 fig. and 2 tables.

SUB CODE: 07/ SUBM DATE: 30Sep64/ ORIG REF: 007/ OTH REF: 012

Card 2/2

L 40096-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/WW/JG

ACC NR: AP6019662

(N)

SOURCE CODE: UR/0073/66/032/006/0555/0559

AUTHOR: Samsonov, G. V.; Antonova, M. M.

ORG: Institute of Materials Science Problems, AN UkrSSR(Institut problem materialovedeniya AN UkrSSR)

TITLE: Phase diagrams of systems of hydrogen with titanium, zirconium, vanadium, and niobium

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 32, no. 6, 1966, 555-559

TOPIC TAGS: titanium, zirconium, vanadium, niobium, metal hydride, PHASE DIAGRAM

ABSTRACT: Phases of the systems titanium-hydrogen, zirconium-hydrogen, vanadium-hydrogen, and niobium-hydrogen with compositions ranging from no hydrogen to $TiH_{1.93}$, ZrH_2 , $VH_{0.915}$, NbH at room temperature were studied by x-ray diffraction. The distribution of the phase regions in the four systems is shown in Fig. 1. It is apparent that the lower boundaries of the region of homogeneity of the β -phase are shifted in a regular manner toward a lower hydrogen content on passing from titanium to niobium; this corresponds to the increase in the filling of the d-subshell of the corresponding transition metals. A satisfactory agreement between x-ray and pycnometric density values was found for the Zr-H and Nb-H systems; the discrepancy of these values in the Ti-H system is attributed to the fact that the hydrides studied

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UDC: 669+621.386

L 40096-66

ACC NR: AP6019662

0

were not in a state of equilibrium. Orig. art. has: 2 figures and 4 tables.

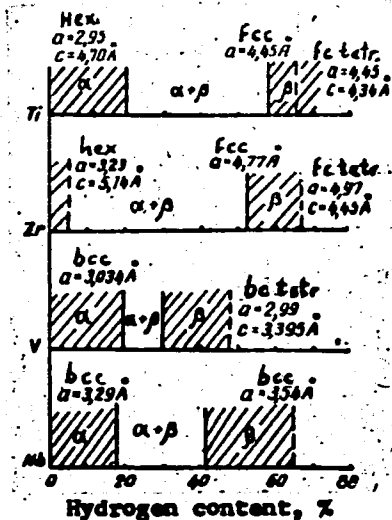


Fig. 1. Distribution of phase regions in the metal-hydrogen systems.

SUB CODE: 07, 11/ SUBM DATE: 24Dec64/ ORIG REF: 003/ OTH REF: 017

Card 2/2 *llb*

L 45915-66 EWT(1)/EWT(m)/EWT(w)/T/EWP(t)/ETI IJF(c) JD/JG/AT
ACC NR: AP6028618

SOURCE CODE: UR/0057/66/036/008/1435/1448

AUTHOR: Samsonov, G.V.; Paderno, Yu.B.; Fomenko, V.S.

ORG: Refractory Materials Section, Institute of Problems in the Study of Materials,
AN UkrSSR, Kiev (Sektor tugoplavkikh materialov Instituta problem materialovedeniya
AN UkrSSR)

TITLE: Concerning the thermionic emission characteristics of the transition metals
and their compounds

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 8, 1966, 1435-1448

TOPIC TAGS: work function, thermionic emission, electron structure, transition
element

ABSTRACT: From considerations of elementary logic and a correct philosophical position concerning the relation of base to superstructure, the authors conclude that the main factor that determines the work function of a thermionic emitter is the electronic structure in the body of the material, and not merely the structure of the surface layers, to which, they say, the majority of investigators in the field have erroneously confined their attention. This paper is an extensive defense of that thesis. The work functions of elements from all parts of the periodic table are compared with the corresponding electronic structures, and the conclusion emerges that a high statistical weight of the stable electron configuration and a low statistical weight of the

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UDC: 537.581

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2/2 mjs

SAMSONOV, I.

Mechanized washing of autobuses. Avt.transp. 32 no.4:13-16 Ap '54.
(MLRA 7:6)

(Motorbuses--Maintenance)